

New data on the morphology and the distribution of *Bulimulus corneus* Sowerby, 1833 (Gastropoda: Pulmonata: Orthalicidae) in Nicaragua

Nuevos datos sobre la morfología y la distribución de *Bulimulus corneus* Sowerby, 1833 (Gastropoda: Pulmonata: Orthalicidae) en Nicaragua

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ABSTRACT

Aspects related to the morphology and distribution of *Bulimulus corneus* Sowerby, 1833 in Nicaragua are presented. Regarding morphology, a complete redescription of the shell and the first description of the genitalia are included. The number of records have been largely increased; from three localities mentioned in the literature to 53. The previous figures have allowed us to draw a preliminary distribution map of the species in Nicaragua, and discuss the presence of the closely related species *Bulimulus unicolor* Sowerby, 1833 in the country.

RESUMEN

Se presentan aspectos relacionados con la morfología y la distribución de *Bulimulus corneus* Sowerby, 1833 en Nicaragua. En relación con la morfología, se presenta una redescrición de la concha y la primera descripción del aparato genital. El número de registros de la especie en el país ha sido notablemente incrementado de tres a 53 localidades. Las cifras anteriores nos han permitido confeccionar un mapa preliminar de distribución para la especie en Nicaragua, así como discutir la presencia de *Bulimulus unicolor* Sowerby, 1833, una especie muy relacionada, en el país.

KEY WORDS: *Bulimulus corneus*, Orthalicidae, morphology, distribution, Nicaragua.

PALABRAS CLAVE: *Bulimulus corneus*, Orthalicidae, morfología, distribución, Nicaragua.

INTRODUCTION

According to BREURE (1979), the genus *Bulimulus* Leach, 1814 contains 88 species, distributed over the Antilles, Central America and northern South America. MARTENS (1890-1901) gave the

distribution of *Bulimulus corneus* Sowerby, 1833 as from SW Mexico to the central zone of Costa Rica, there being apparently no records outside of these limits. In Nicaragua, previous reports

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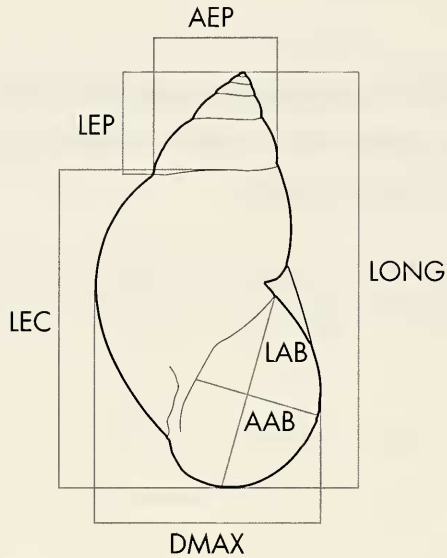


Figure 1. *Bulimulus corneus*. Shell measurements.

Abbreviations. LONG: length; DMAX: maximum diameter; LEC: height of the body whorl; DME: minimum diameter; LAB: aperture length; AAB: aperture width; LEP: spire length; AEP: spire width.

Figura 1. *Bulimulus corneus*. Medidas de la concha.

Abreviaturas. LONG: longitud; DMAX: diámetro máximo; LEC: altura de la vuelta principal; DME: diámetro mínimo; LAB: altura de la abertura; AAB: anchura de la abertura; LEP: altura de la espira; AEP: anchura de la espira.

have been from Realejo (Chinandega), San Juan Castillo (sic), El Toro rapids, RAAN (Autonomous Region of the North Atlantic) (MARTENS, 1890-1901) and Bluefields (FLUCK, 1900).

Martens stated that this species is closely related to *Bulimulus unicolor* Sowerby, 1833, and this was confirmed by PILSBRY (1897). None of the authors recognized TATE's (1870) reports of *B. unicolor* from Granada, Mesapa and San Nicolas, on the Pacific slope of Nicaragua.

The internal and external morphology of *B. corneus*, shell measurements and data on distribution were recently presented for the first time in an abstracted version (PÉREZ AND LÓPEZ, 1995), and are here given in detail. New distribution data gathered in the last few months are also presented, together with a commentary on the presence of *B. unicolor* in Nicaragua.

MATERIALS AND METHODS

All specimens were hand-collected and live specimens were relaxed in menthol and fixed in 70% alcohol. All individuals considered for the study were fully-grown adult specimens. All localities reported are additions to those previously mentioned in the literature. The list of localities is given in Table I. The distribution map was made using the UTM cartographic method with a grid size of 100 Km². When more than one locality occur on the same UTM 10 Km² quadrat, only the one that appears first in the list is mapped. The abbreviations w. l. n. and Bib. means without lot number and bibliographic locality respectively.

The variables measured in the shells are (Fig. 1): 1. length (LONG), 2. maximum diameter (DMAX), 3. height of body whorl (LEC), 4. minimum diameter (DME), 5.

aperture length (LAB), 6. aperture width (AAB), 7. spire length (LEP), 8. spire width (AEP). All measurements were made in adult specimens.

We calculated various descriptive statistics for the measured variables, in order to give a morphological description of the samples. We also used a Principal Component Analysis (PCA) to explore the variability among populations.

RESULTS AND DISCUSSION

Description: Shell (Fig. 2): Shell thin, spirally striate, corneous to brown, somewhat translucent, showing through the dark bands that stipple the mantle. Profile bulimoid-conic. Apex obtuse; protoconch typically bulimoid with sculpture of punctures in an irregular decussate pattern; whorls 5.5 to 6. Aperture ovate, margin thin, sharp, umbilicus narrow. Measurements taken on the shell are presented in Tables I and II.

Genitalia (Fig. 3): Penis with wide sheath, dilated in its central part, and reaching to more than one half of the phallus. Epiphallus approximately half as wide as penis. Flagellum thinner, approximately one half the phallus length. Sperm conduct thickened at mid-center, ending at globose spermatheca distally. Vagina more or less fusiform, slightly longer than the penis, and $2/3$ the width.

We have found that shell dimensions are quite variable within (Table I) and between populations (Table II), as also mentioned by PILSBRY (1897). For this reason, and because of the small total sample size ($n = 44$) studied from all populations (11) we have not considered the taxonomical implications of the variability. However, it should be mentioned that shell length (LONG) and height of body whorl (LEC) display the highest variances of all variables considered (Table II). Shell length is always one of the variables on which descriptions are based. We recommend caution in the use of either variables for a taxonomic characterization of the species.

It must be pointed out that THOMPSON (1967) invalidated various subspecies of the closely-related *Bulimulus unicolor* So-

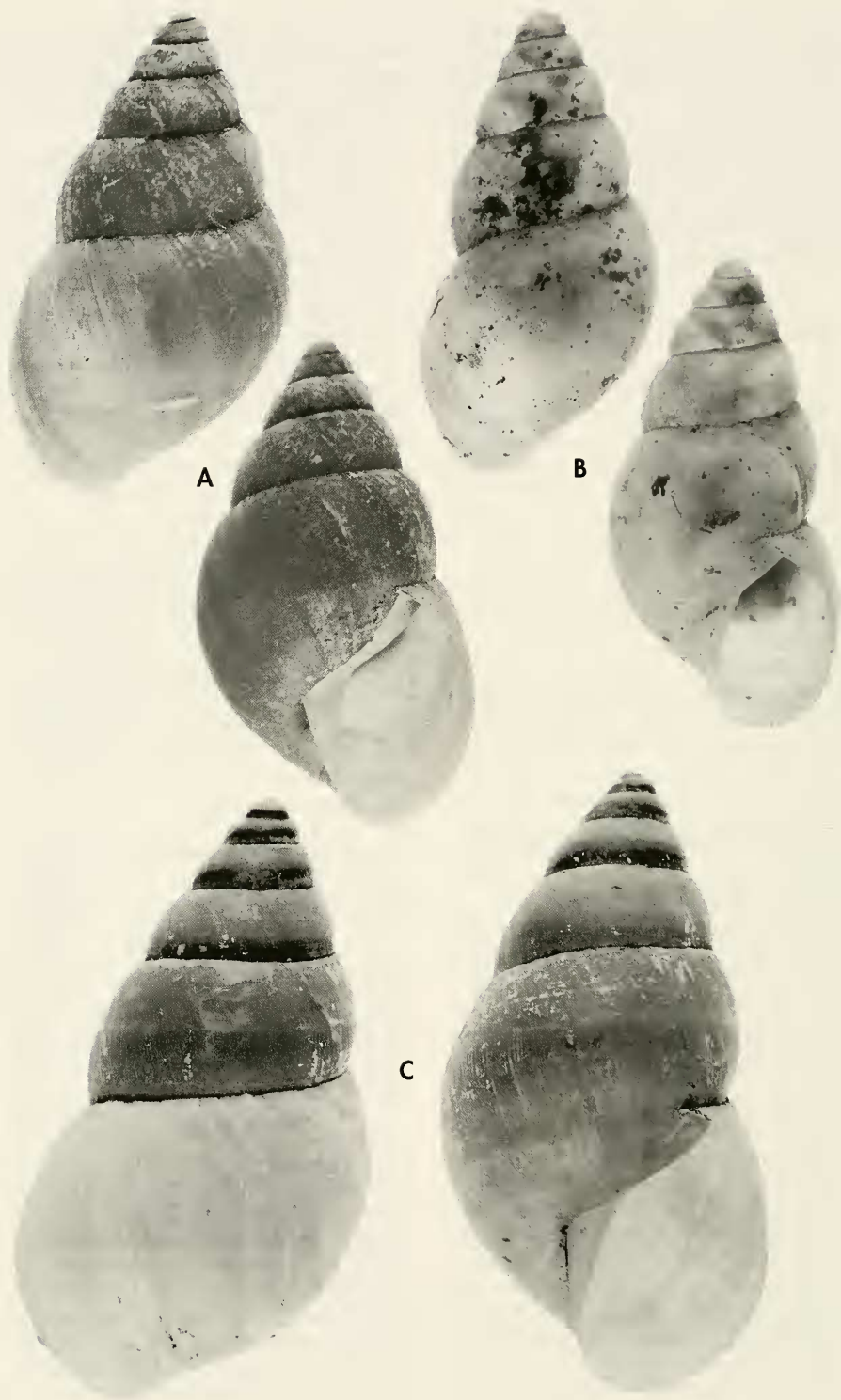
werby, 1833, believing them to be variations related to climatic conditions. In this paper he considered shell length (LONG), maximum diameter (DMAX) and two other variables.

In the PCA made from conchological variables it is possible to see the marked scatter of the specimens (Fig. 4). Within the plot, there is a segregation of six individuals from the populations of El Guayabo, Granada (1), Xiloá, Managua (2), and Las Lajas, Rivas (3). It is interesting to notice that the other specimen from Rivas is located within the cloud of points. The only specimen considered from the Nicaraguan Atlantic slope (6), can be observed between the cloud of points and the six individuals previously mentioned.

Another three specimens from Ocotal (9) segregate towards the lower right corner of the scatterplot. These specimens, as the previous six, have conchological features very much like the ones from other populations (see Table I), although the ones from Ocotal have larger sizes.

In Table III, it can be seen the contribution made by each principal component to total variance. Components I (70.77%) and II (18.15%), comprise the major quantity of total variance (88.92%). The absence of negative signs (Table IV) among the eigen values obtained for component I, also with the larger contribution (70.77%), allow us to presume that it is related to size and II is related to shape. Thus, differences among populations would be apparently due to size rather than shape; and it is known that size is usually influenced by ecological factors, and consequently is highly correlated with local environmental conditions (BEROVIDES, 1988).

In their genitalia (see Figure 3), the individuals from the populations of UCA Campus (Managua Department) and Ocotal (Nueva Segovias Department) share the same external morphology and show only small differences in size of the structures. However, a more detailed anatomical analysis, including an analysis of the internal anatomy of the genital ducts (v. g. penis), of the Ocotal population is required when fresh material is available.



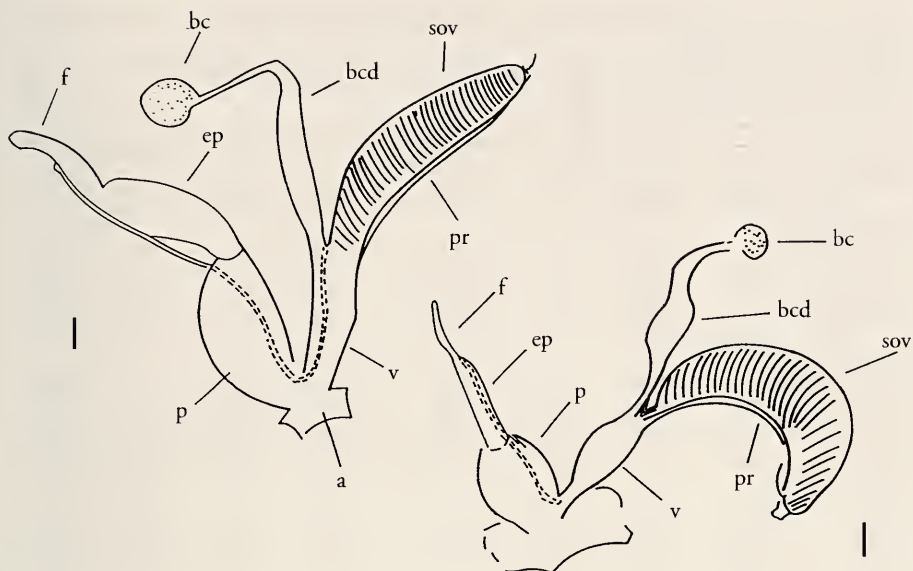


Figure 3. *Bulimulus corneus*. Genitalia. A: specimen from Ocotal; B: specimen from Campus UCA; pr: prostate; p: penis; f: flagellum; a: atrio; (sp: spermatheca)= bc: bursa copulatrix; s. ov: spermoviduct; sp. d: spermathecal duct; ep: epiphallus; v: vagina. Scale bars 1 mm.

Figura 3. *Bulimulus corneus*. Aparato genital. A: ejemplar de Ocotal; B: ejemplar del Campus UCA; pr: próstata; p: pene; f: flagelo; a: atrio; (sp: espermateca)= bc: bolsa copulatrix; s. ov: espermoviducto; sp. d: conducto espermático; ep: epifalo; v: vagina. Escalas 1 mm.

Distribution: Fifty three localities for *B. corneus* have been added to those previous recorded. They distributed over 12 Departments in the three natural regions that comprise the country (Fig. 5, Table V).

CONCLUSIONS

The distribution map gives a clear idea of *B. corneus* distribution in Nicaragua. As pointed out by JACOBSON (1968),

a fairly continuous distribution can be seen among the samples, suggesting that absence in other areas is due to lack of sampling, and that *B. corneus* is widespread in the country.

B. corneus has a very wide ecological tolerance, occurring from low altitude to more than 2000 m. The species inhabits a remarkable number of different microhabitats, including soil with herbs, soil with litter, tree trunks, logs, stones, walls of ruined houses, etc. The wide geographical distribution of the species, can pro-

(Left page). Figure 2. *Bulimulus corneus*. Shell morphology. A: Las Canoas (length 12.8 mm, diameter 7.0 mm); B: Campus UCA (length 10.6 mm, diameter 6.7 mm), C: Ocotal (length 19.9 mm, diameter 11.35 mm).

(Página izquierda). Figura 2. *Bulimulus corneus*. Morfología de la concha. A: Las Canoas (longitud 12,8 mm, diámetro 7,0 mm); B: Campus UCA (longitud 10,6 mm, diámetro 6,7 mm); C: Ocotal (longitud 19,9 mm, diámetro 11,35 mm).

Table I. Variables measured considering each sample separately (X= average, S= standard deviation). Abbreviations as in Figure 1.

Tabla I. Variables medidas considerando los ejemplares de cada muestra independientemente (X= media, S= desviación standard). Abreviaturas como en la Figura 1.

LOCALITIES	VARIABLES							
	LONG	DMAX	LEC	DME	LAB	AAB	LEP	AEP
Xiloá (n= 6)								
X	10.93	6.70	7.14	6.13	5.51	3.87	4.38	4.85
Mín	10.10	5.80	5.5	5.30	5.1	2.95	2.9	4.5
Máx	11.70	7.50	8.6	6.5	6.0	4.7	5.8	5.4
S	0.62	0.61	1.37	0.46	0.33	0.63	1.29	0.35
Apoyo (n= 10)								
X	11.62	8.19	8.82	6.31	5.27	3.25	3.6	4.49
Mín	10.0	6.3	7.8	5.5	4.6	2.4	2.4	3.7
Máx	13.5	8.0	10.0	7.3	6.0	3.9	4.75	5.15
S	1.04	0.52	0.76	0.48	0.42	0.42	0.64	0.45
Asososca (n= 4)								
X	12.7	7.7	9.27	7.0	5.5	3.6	3.82	4.9
Mín	12.0	6.5	8.4	5.7	4.5	2.7	3.35	4.3
Máx	13.1	7.8	9.6	7.1	5.7	3.8	4.1	5.0
S	0.59	0.17	0.42	0.1	0.35	0.21	0.41	0.16
Las Canoas (n= 5)								
X	13.02	7.38	9.46	6.6	5.5	3.62	4.33	4.97
Mín	12.5	6.8	9.0	6.3	5.2	3.2	4.2	4.7
Máx	13.8	7.7	10.0	7.2	5.8	4.3	4.6	5.25
S	0.52	0.57	0.42	0.35	0.22	0.42	0.17	0.26
El Guayabo (n= 5)								
X	10.65	6.15	5.75	5.95	5.55	4.85	5.3	5.05
Mín	10.1	6.0	5.5	5.8	5.1	4.8	4.6	4.7
Máx	11.2	6.3	6.0	6.1	6.0	4.9	6.0	5.4
S	0.78	0.2	0.35	0.22	0.64	0.22	0.99	0.5
Las Lajas (n= 2)								
X	14.25	7.3	6.82	6.7	6.35	4.15	5.37	5.8
Mín	12.9	6.5	6.3	6.0	5.7	3.8	5.25	5.5
Máx	15.6	8.1	7.35	7.4	7.0	4.5	5.5	6.1
S	1.91	1.13	0.74	0.99	0.92	0.5	0.18	0.65
Tepeyac (n= 2)								
X	11.25	7.1	8.75	5.85	4.8	3.55	3.35	4.5
Mín	11.0	6.7	8.6	5.0	4.7	3.2	3.3	4.4
Máx	11.5	7.3	8.9	6.7	4.9	3.9	3.4	4.6
S	0.35	0.42	0.21	1.2	0.14	0.5	0	0.14
Ocotlán (n= 4)								
X	17.12	9.52	12.57	8.72	7.9	4.92	5.40	6.16
Mín	13.6	8.0	10.5	8.0	7.4	4.2	3.8	5.25
Máx	19.9	11.35	14.2	10.0	8.4	5.2	6.9	7.2
S	2.70	2.70	1.54	0.87	0.48	0.5	1.34	0.80
Campus UCA (n= 3)								
X	11.56	7.2	8.78	6.5	5.03	3.46	3.32	4.47
Mín	10.6	6.7	8.3	6.0	4.9	3.0	2.8	4.1
Máx	12.8	7.8	9.55	7.2	5.1	3.8	3.8	4.9
S	1.12	0.55	0.63	0.64	0.12	0.42	0.50	0.41
Laurel Galán (n= 3)								
X	12.45	7.6	8.95	6.7	6.02	3.47	3.7	4.6
Mín	11.4	7.0	8.35	6.0	4.9	3.0	2.8	4.1
Máx	13.35	8.1	9.5	7.3	6.35	3.6	4.0	5.0
S	0.98	0.55	0.57	0.65	0.45	0.12	0.29	0.46

Table II. Variables measured considering all samples pooled. (X= average; Min: minimum value; Max: maximum value; S= standard deviation). Abbreviations as in Figure 1.

Tabla II. Variables medidas considerando los ejemplares de todas las muestras agrupadas. (X= media; Min: valor mínimo; Max: valor máximo; S= desviación standard). Abreviaturas como en la Figura 1.

Variables	X	Min	Max	S
LONG	12.40	10	19.90	2.02
DMAX	7.32	5.8	11.35	0.99
LEC	8.78	4.1	14.20	1.89
DME	6.59	5.0	10.00	0.89
LAB	5.64	4.5	8.40	0.87
AAB	3.70	2.4	5.30	0.67
LEP	4.12	2.4	6.90	0.97
AEP	4.86	3.7	7.20	0.64

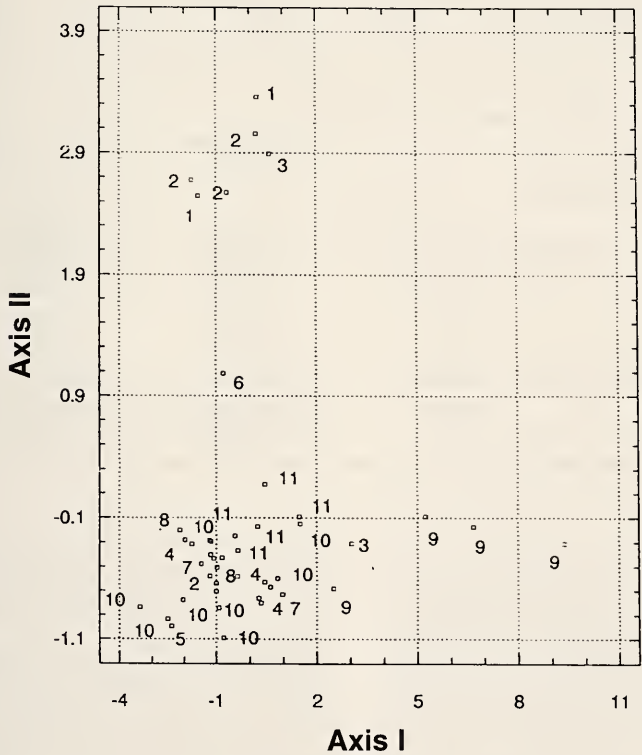


Figure 4. Axis I and II of the Principal Component Analysis. Each number represents a sample. 1: El Guayabo; 2: Xiloá; 3: Las Lajas; 4: Asosasca; 5: Campus UCA; 6: Loma del Mico; 7: Laurel galán; 8: Tepeyac; 9: Ocotal; 10: Apoyo; 11: La Ceiba.

Figura 4. Ejes I y II del Análisis de Componentes Principales. Los números corresponden a las muestras. 1: El Guayabo; 2: Xiloá; 3: Las Lajas; 4: Asosasca; 5: Campus UCA; 6: Loma del Mico; 7: Laurel galán; 8: Tepeyac; 9: Ocotal; 10: Apoyo; 11: La Ceiba.

Table III. Percentage of variance explained by each one of the principal components. Abbreviations as in Figure 1.

Tabla III. Porcentaje de varianza explicado por cada uno de los componentes principales. Abreviaturas como en la Figura 1.

Component	Percent of cumulative number	Variance percentage
LONG	70.77	70.77
DMAX	18.15	88.92
LEC	4.72	93.64
DME	2.23	95.88
LAB	2.06	97.95
AAB	0.89	98.84
LEP	0.71	99.55
AEP	0.44	100.00

Table IV. Eigen values obtained with Principal Component Analysis, considering axes I, II and III. Abbreviations as in Figure 1.

Tabla IV. Valores propios obtenidos con el Análisis de Componentes Principales, considerando los ejes I, II y III. Abreviaturas como en la Figura 1.

Variables	Components		
	I	II	III
LONG	0.3995	-0.1351	0.2987
DMAX	0.3726	-0.3116	-0.0867
LEC	0.3072	-0.4996	0.0703
DME	0.3872	-0.2181	-0.2486
LAB	0.3902	0.0308	-0.0825
AAB	0.2860	0.4631	-0.7271
LEP	0.2861	0.5339	0.4999
AEP	0.3756	0.2948	0.2258

bably be explained by the numerous microhabitats that it is capable of filling.

Considering at the same time the morphological variability and the ecological range of this species, WOLDA's (1970) statement comes to mind, that variation should be understood in terms of the possibilities of survival in natural populations, and not only as a biologically isolated fact about the ecology of species.

Regarding the presence of *B. unicolor* in Nicaragua, Tate's reports were not recognized by MARTENS (1890-1901), or by PILSBRY (1897), and may have had their

origin in the marked variability of *B. corneus*. We think that only *B. corneus* is found in Nicaragua.

PILSBRY (1897), mentioned Greytown (RAAN: Autonomous Region of the North Atlantic), and later Fluck (1900) gave Bluefields (RAAS: Autonomous Region of the South Atlantic) as localities for *B. unicolor* in Nicaragua. More recently, BREURE (1979) quoted Perico Island in the Bay of Panamá as the only locality in Central America.

In the last two years we have collected specimens from Bluefields, one of

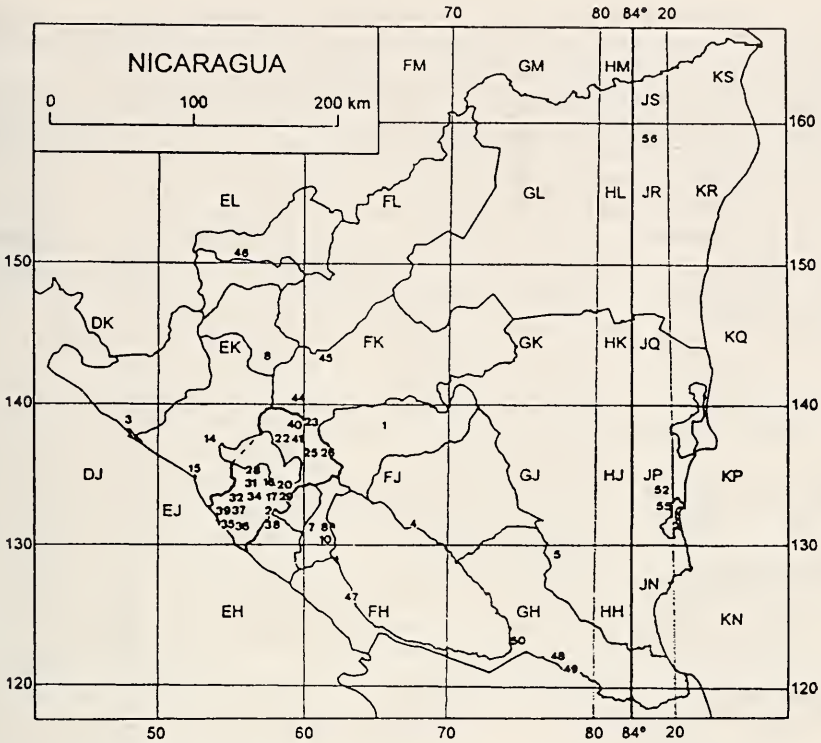


Figure 5. *Bulimulus corneus*. Distribution in Nicaragua, in UTM notation of 100 Km².
Figura 5. *Bulimulus corneus*. Distribución en Nicaragua, en notación UTM de 100 Km².

the localities for *B. unicolor*, and two other nearby localities (Las Delicias and La Fonseca) (see Table IV). This material agrees well with the description of *B. corneus*.

We are therefore led to think either that in these localities both species live sympatrically, and we have not so far collected *B. unicolor*, or that *B. unicolor* does not occur there at all.

In view of the fact that in the revision of the subfamily BREURE (1979) did not include distribution data for *B. unicolor* in Nicaragua, and taking into account the morphological variability that THOMPSON (1967) has shown in both *B. unicolor*, and *B. corneus*, as mentioned by Pilsbry and also studied by us, we have decided for the moment to accept that the latter species is the only one that occurs in Nicaragua.

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Table V. List of new localities for *B. corneus* Sw., in Nicaragua. S= number of shells, Sa= specimens in alcohol. The samples used for statistical purposes are marked with an asterisk. Bibliographic localities are considered as Bib under "Lot number". w. l. n. means: "without lot number".

Tabla V. Lista de nuevas localidades para B. corneus Sw., en Nicaragua. S= número de conchas, Sa= especímenes en alcohol. Las muestras usadas con propósitos estadísticos aparecen marcadas con un asterisco. Las localidades bibliográficas aparecen con la abreviatura Bib en "Lot number"; w. l. n. significa: "sin número de lote".

Code	Lot number	Localities	Coordinates Geographical	UTM	Material examined
BOACO Department					
1	92:19	El Sácal	12°33'10" N, 85°33'30" W	16PFJ 58	6S
CARAZO Department					
2	90:18	La Baronesa	12°10' N, 87°17' W	16PFJ 72	12S
CHINANDEGA Department					
3	Bib	Realejo	12°39'27" N, 83°9'18" W	16PDJ 78	?
CHONTALES Department					
4	92:14	Punta Mayal	11°52'20" N, 85°26' W	16PFJ 71	2S
5	88:30	Nueva Guinea	11°43' N, 84°57' W	16PGH 79	2S
ESTELI Department					
6	93:09	Estanzuela	13°14'04" N, 86°22'16" W	16PEK 73	2S
GRANADA Department					
7	91:26	Tepeyac	11°52.5' N, 85°59.5' W	16PFJ 01	2S(*)
8	92:01	Aguas Calientes, Cocibolca	11°52' N, 85°55'40" W	16PFJ 11	2S
9	w.l.n	Isleta de Ken	11°51'41" N, 85°53'40" W	16PFJ 11	2S
10	92:12	Laguna Blanca	11°46'15 N, 85°57'45" W	16PFJ 10	4S
11	95:72	El Guayabo	11°58' N, 85°59' W	16PFJ 11	5S(*)
12	93:10	Apoyo	11°55' N, 85°57'45" W	16PFJ 01	10S+5Sa
LEON Department					
13	90:05	Asososca	12°26' N, 86°40' W	16PEJ 37	4S(*)
14	90:06	Laguna Monte, Galán	12°26' N, 86°40' W	16PEJ 47	15S
15	88:26	Salinas Grandes	12°16'12" N, 86°30'4" W	16PEJ 25	6S
MANAGUA Department					
16	88:21	Villa Carmen	12°19' N, 86°16' W	16PEJ 74	10S+4Sa
17	88:28	Las Sierritas	12°3' N, 86°16' W	16PEJ 73	6S
18	90:07	Xiloá	12°14' N, 86°46' W	16PEJ 74	6S(*)
19	91:31	Asososca	12°18'11" N, 85°19'8" W	16PEJ 74	1S
20	92:20	Las Mercedes, Lago Xolotlán	12°9'30" N, 86°10' W	16PEJ 84	2S
21	93:39	Apoyeque	12°15' N, 86°21' W	16PEJ 74	9S
22	94:47	San Francisco Libre	12°30'12" N, 86°17'40" W	16PEJ 78	1S
23	95:01	Los Placeres, Km 63	12°33' N, 86°3'41" W	16PFJ 08	5Sa
24	95:04	Km 66.8 Carr. Matagalpa	12°29'06" N, 86°04'17" W	16PFJ 08	1Sa

Table V. Continuation.
Tabla V. Continuación.

Code	Lot number	Localities	Coordinates		Material examined
			Geographical	UTM	
25	95:06	Km 42.5 Carr. Matagalpa	12°21'02" N, 86°02'58" W	16PFJ 06	7S
26	95:07	Las Canoas	12°19'00" N, 80°00'07" W	16PFJ 16	1S
27	95:12	Las Canoas	12°19'05" N, 85°59'22" W	16PFJ 06	15S
28	95:26	Mateare	12°14'10" N, 86°25'48" W	16PEJ 65	10S
29	95:13	Carr. Tipitapa-Masaya, Km 43	12°09'48" N, 86°00'07" W	16PEJ 65	10S
30	95:27	La Polvosa	12°13'24" N, 86°24'59" W	16PEJ 65	11S
31	95:28	Sierra de San Andrés	12°10'28" N, 86°24'35" W	16PEJ 64	32S
32	95:31	Nandayosi	12°06'43" N, 86°31'14" W	16PEJ 53	3S
33	95:32	Nandayosi, cerca del río	12°06'54" N, 86°30'16" W	16PEJ 53	13S
34	95:34	Los Filos de Guajachillo	12°08'33" N, 86°24'33" W	16PEJ 42	4S
35	95:38	San Bartolo	11°54'58" N, 86°33'05" W	16PEJ 41	7S
36	95:39	El Conchital	11°54'18" N, 86°33'43" W	16PEJ 41	15S
37	95:40	Hacienda "El Apante"	11°57'48" N, 86°29'15" W	16PEJ 52	3S
38	95:44	Hacienda "El Callao"	12°01'42" N, 86°20'07" W	16PEJ 72	14S
39	95:45	Samaria	11°59'13" N, 86°32'39" W	16PEJ 42	2S
40	95:57	El Tamarindo	12°29'37" N, 86°05'01" W	16PEJ 98	3S
41	95:59	El Platanal	12°27'06" N, 86°05'02" W	16PEJ 97	1S
42	95:64	Carr. Sur, Km 15.5, INCAE	10°03'13" N, 86°18'33" W	16PEJ 73	1S
43	95:72	Campus UCA	12°07'30" N, 86°16'13" W	16PEJ 74	3Sa(*)
MATAGALPA Department					
44	92:83	Ciudad Darío	12°43'50" N, 86°11'53" W	16PEK 90	13S
45	92:88	Fuentepura	12°58' N, 86°55' W	16PFK 13	2S
NUEVA SEGOVIAS Department					
46	94:59	Ocatál	13°36'35" N, 86°28'18" W	16PEL 51	5S(*)
RIVAS Department					
47	92:39	Río Las Lajas	11° N, 85° W	16PFH 35	2S(*)
RIO SAN JUAN Department					
48	92:24	La Toboba	11°8' N, 84°57'50" W	16PGH 72	2S
49	92:25	El Castilla	11°7'20" N, 84°24' W	16PGH 81	5S
50	w.l.n	San Carlos	12°7'20" N, 86°46' W	16PGH 43	7S
51	92:26	Laurel Galán	12°7' N, 86°46' W	16PGH 43	3S(*)
RAAS (AUTONOMOUS REGION OF THE SOUTH ATLANTIC)					
52	93:23C	Las Delicias	12°16'12" N, 83°52'50" W	17PJP	5S
53	93:23B	La Fonseca	12°15'36" N, 83°58'48" W	17PJP	2S
54	94:19	Loma del Mico	12°4'24" N, 83°47'42" W	17PJP	1S(*)
55	Bib	Bluefields	12° N, 83°44'18" W	17PJP	?
RAAN (AUTONOMOUS REGION OF THE NORTH ATLANTIC)					
56	Bib	San Juan Castillo	14°24' N, 83°54'54" W	17PJR	?

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